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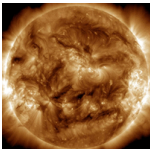
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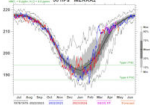
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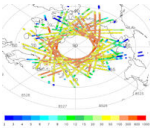
There are no equatorial coronal holes on the Earthside of the sun. Credit: SDO/AIA

**Polar Stratospheric Clouds**  
Colorful Type II polar stratospheric clouds (PSC) form when the temperature in the stratosphere drops to a staggeringly low -85C. NASA's MERRA-2 climate model predicts when the air up there is cold enough.



On July 06, 2024, the Arctic stratosphere is **much too warm** for Type II polar stratospheric clouds. | [more data](#)

**Noctilucent Clouds**  
They're back! The northern season for NLCs is underway. The first clouds were detected inside the Arctic Circle on May 25, 2024, by the NOAA-21 satellite. The clouds have since spread, and now observers are seeing from the ground as well.



Updated: July 04, 2024  
An instrument onboard NOAA-21 (CMISS LD) is able to detect NLCs (also known as "polar mesospheric clouds" or PMCs). In the daily map, above, each dot is a detected cloud. As the season progresses, these dots will multiply in number and shift in hue from blue to red as the brightness of the clouds intensifies.

**SPACE WEATHER NOAA Forecasts**

Updated at: 2024 Jul 05 2200 UTC

|         |         |          |
|---------|---------|----------|
| FLARE   | 0-24 hr | 24-48 hr |
| CLASS M | 35 %    | 35 %     |
| CLASS X | 05 %    | 05 %     |

**Geomagnetic Storms:**  
Probabilities for significant disturbances in Earth's magnetic field are given for three activity levels: [active](#), [minor storm](#), [severe storm](#).

Updated at: 2024 Jul 05 2200 UTC

**Mid-latitudes**

|        |         |          |
|--------|---------|----------|
|        | 0-24 hr | 24-48 hr |
| ACTIVE | 10 %    | 10 %     |
| MINOR  | 01 %    | 01 %     |
| SEVERE | 01 %    | 01 %     |

**High latitudes**

|        |         |          |
|--------|---------|----------|
|        | 0-24 hr | 24-48 hr |
| ACTIVE | 15 %    | 15 %     |
| MINOR  | 20 %    | 20 %     |
| SEVERE | 20 %    | 20 %     |

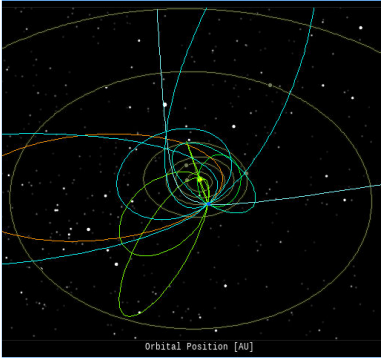
**Realtime Noctilucent Cloud Photo Gallery**

Free: [SpaceWeather.com Newsletter](#)

**All Sky Fireball Network**

Every night, a network of [NASA all-sky cameras](#) scans the skies above the United States for meteoritic fireballs. Automated software maintained by NASA's Meteoroid Environment Office calculates their orbits, velocity, penetration depth in Earth's atmosphere and many other characteristics. Daily results are presented here on SpaceWeather.com.

On Jul 05, 2024, the network reported **13** fireballs.  
(12 sporadic, 1 Northern June Aquid)



In this diagram of the inner solar system, all of the fireball orbits intersect at a single point—Earth. The orbits are [color-coded](#) by velocity, from slow (red) to fast (blue). | [Larger image](#) | [movies](#)

**Near Earth Asteroids**

Potentially Hazardous Asteroids (PHAs) are space rocks larger than approximately 100m that can come closer to Earth than 0.05 AU. None of the known PHAs is on a collision course with our planet, although astronomers are finding [new ones](#) all the time.

On July 6, 2024 there were **2349** potentially hazardous asteroids.

**Recent & Upcoming Earth-asteroid encounters:**

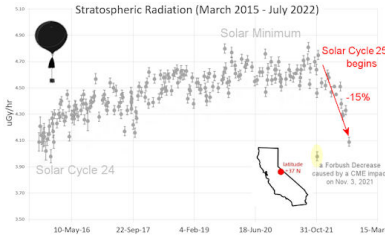
| Asteroid  | Date(UT)    | Miss Distance | Velocity (km/s) | Diameter (m) |
|-----------|-------------|---------------|-----------------|--------------|
| 2024 LJ2  | 2024-Jul-01 | 19.8 LD       | 10.4            | 82           |
| 2022 BY39 | 2024-Jul-02 | 13.2 LD       | 3               | 4            |
| 2024 LH   | 2024-Jul-02 | 4.4 LD        | 4.3             | 32           |
| 2024 NC   | 2024-Jul-02 | 13.6 LD       | 5.5             | 35           |
| 2024 NB   | 2024-Jul-02 | 4.7 LD        | 12.7            | 25           |
| 2024 NE   | 2024-Jul-03 | 13.5 LD       | 15.6            | 59           |
| 2024 KO1  | 2024-Jul-04 | 14.9 LD       | 6.9             | 57           |
| 2024 NM1  | 2024-Jul-06 | 1.8 LD        | 18              | 17           |
| 2024 MT1  | 2024-Jul-08 | 3.9 LD        | 18.1            | 78           |
| 2024 NB1  | 2024-Jul-09 | 14.6 LD       | 9.7             | 65           |
| 2024 ME1  | 2024-Jul-10 | 11.3 LD       | 8.4             | 42           |
| 2022 YS5  | 2024-Jul-11 | 11 LD         | 5.8             | 38           |
| 2024 NG   | 2024-Jul-13 | 9 LD          | 7               | 18           |
| 2024 BY15 | 2024-Jul-16 | 16.2 LD       | 0.7             | 16           |
| 2024 NF   | 2024-Jul-17 | 12.6 LD       | 20.3            | 72           |
| 2024 MG1  | 2024-Jul-21 | 11.1 LD       | 9.3             | 58           |
| 2024 NH   | 2024-Jul-23 | 13.2 LD       | 5.5             | 30           |
| 2024 LY2  | 2024-Jul-23 | 12 LD         | 7.8             | 94           |
| 2021 MW1  | 2024-Jul-25 | 10.1 LD       | 8               | 120          |
| 2024 MH1  | 2024-Jul-26 | 4.7 LD        | 5.8             | 26           |
| 2011 AM24 | 2024-Jul-26 | 16.8 LD       | 6.2             | 281          |
| 523664    | 2024-Jul-28 | 14.9 LD       | 23.7            | 680          |
| 2020 PN1  | 2024-Aug-02 | 18 LD         | 5.5             | 29           |
| 2023 HB7  | 2024-Aug-05 | 14.6 LD       | 6.1             | 32           |
| 2017 TU1  | 2024-Aug-05 | 10.1 LD       | 10.1            | 22           |
| 2024 KH3  | 2024-Aug-10 | 14.6 LD       | 11.4            | 196          |
| 2024 GH4  | 2024-Aug-16 | 17.7 LD       | 6.3             | 59           |
| 2024 JV3  | 2024-Aug-19 | 12 LD         | 11.1            | 213          |
| 2022 BF2  | 2024-Aug-19 | 19.7 LD       | 16.4            | 91           |
| 2020 RL   | 2024-Aug-27 | 12.2 LD       | 8.2             | 34           |
| 2021 RA10 | 2024-Aug-28 | 6.8 LD        | 4.9             | 29           |
| 2012 SX49 | 2024-Aug-29 | 11.2 LD       | 4.3             | 20           |
| 2016 RJ20 | 2024-Aug-30 | 18.3 LD       | 14.8            | 68           |
| 2021 JT   | 2024-Sep-01 | 16.4 LD       | 8.2             | 12           |
| 2021 RB16 | 2024-Sep-02 | 12.3 LD       | 8.4             | 15           |
| 2007 RX9  | 2024-Sep-02 | 18.5 LD       | 7               | 44           |

Notes: LD means "Lunar Distance." 1 LD = 384,401 km, the distance between Earth and the Moon. 1 LD also equals 0.0026 AU.

**Cosmic Rays in the Atmosphere**

**SPACE WEATHER BALLOON DATA:** Almost once a week, SpaceWeather.com and the students of [Earth to Sky Calculus](#) fly space weather balloons to the stratosphere over California. These balloons are equipped with sensors that detect secondary cosmic rays, a form of radiation from space that can penetrate all the way down to Earth's surface. Our monitoring program has been underway without interruption for 7 years, resulting in a unique dataset of *in situ* atmospheric measurements.

**Latest results (July 2022):** Atmospheric radiation is decreasing in 2022. Our latest measurements in July 2022 registered a 6-year low:



What's going on? Ironically, the radiation drop is caused by increasing solar activity. Solar Cycle 25 has [poared to life](#) faster than forecasters expected. The sun's strengthening and increasingly tangled magnetic field repels cosmic rays from deep space. In addition, solar coronal mass ejections (CMEs) sweep aside cosmic rays, causing sharp reductions called "[Tobuch Decreases](#)." The two effects blend together to bring daily radiation levels down.

.Who cares? Cosmic rays are a surprisingly "down to Earth" form of space weather. They can alter the chemistry of the atmosphere, [trigger lightning](#), and [penetrate commercial airplanes](#). According to a [study](#) from the Harvard T.H. Chan school of public health, crews of aircraft have higher rates of cancer than the general population. The researchers listed [cosmic rays](#), irregular sleep habits, and chemical contaminants as leading risk factors. A number of controversial studies ([#1](#), [#2](#), [#3](#), [#4](#)) go even further, linking cosmic rays with cardiac arrhythmias and sudden cardiac death.

**Technical notes:** The radiation sensors onboard our helium balloons detect X-rays and gamma-rays in the energy range 10 keV to 20 MeV. [These energies](#) span the range of medical X-ray machines and airport security scanners.



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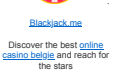
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Data points in the graph labeled "Stratospheric Radiation" correspond to the peak of the [Regener-Plotzer maximum](#), which lies about 67,000 feet above central California. When cosmic rays crash into Earth's atmosphere, they produce a spray of secondary particles that is most intense at the entrance to the stratosphere. Physicists Eric Regener and Georg Plotzer discovered the maximum using balloons in the 1930s and it is [what we are measuring today](#).

Essential web links

- [LINK](#) [NOAA Space Weather Prediction Center](#)  
The official U.S. government space weather bureau
- [LINK](#) [Atmospheric Optics](#)  
The first place to look for information about sundogs, pillars, rainbows and related phenomena.
- [LINK](#) [Solar Dynamics Observatory](#)  
Researchers call it a "Hubble for the sun." SDO is the most advanced solar observatory ever.
- [LINK](#) [STEREO](#)  
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- [LINK](#) [SolarMonitor.org](#)  
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- [LINK](#) [Starlink Satellite Statistics](#)  
current counts of failed and deployed Starlink satellites from Jonathan's Space Page. See also, [all satellite statistics](#).
- [LINK](#) [The Aerospace Corporation](#)  
Authoritative predictions of space junk and satellite re-entries
- [LINK](#) [Daily Sunspot Summaries](#)  
from the NOAA Space Environment Center
- [LINK](#) [NOAA 27-Day Space Weather Forecasts](#)  
fun to read, but should be taken with a grain of salt! Forecasts looking ahead more than a few days are often wrong.
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